

U.S. EPA. 1991. *Methods for Aquatic Toxicity Identification Evaluations, Phase I Toxicity Characterization Procedures*, 2nd ed. U.S. Environmental Protection Agency, Office of Research and Development, Environmental Research Laboratory, Duluth, MN. EPA/600/6-91/003. (NTIS: PB92-100072).

Media in which methods can be used: ☒ **Water** ☐ **Sediment** ☐ **Biota**

Keywords: **Water quality, sediment quality, toxicity/bioassay, sampling**

Abstract

This Phase I document is the first of a three phase series of documents that provide methods to characterize and identify the cause of toxicity in effluents. The first phase of the series, Phase I, characterized the physical/chemical nature of the acute and chronic toxicant(s), thereby simplifying the analytical work needed to identify the toxicant(s). Phase II provides guidance to identify the suspect toxicants, and the last phase, Phase III provides methods to confirm that the suspect toxicants are indeed the cause of toxicity. These recent TIE documents have been produced or revised to include chronic toxicity recommendations and additional information or experiences we have gained since the original methods were printed.

The manual describes procedures for characterizing the physical/chemical nature of toxicants in acutely toxic effluent samples, with applications to other types of samples such as receiving water samples, sediment pore water or elutriate samples, and hazardous wastes. The presence and the potency of the toxicants in the samples are detected by performing various manipulations on the sample and by using aquatic organisms to track the changes in the toxicity. This toxicity tracking step is the basis of the toxicity identification evaluation (TIE). The final step is to separate the toxicants from the other constituents in the sample in order to simplify the analytical process. Many toxicants must be concentrated for analysis.

Since the first document was developed, additional options or new procedures have been developed. For example, additional options are provided in the EDTA and sodium thiosulfate addition tests, and in the graduated pH test. Also a discussion has been added for testing the effluent sample over time (weekly) to measure the rate of decay of toxicity which is used to detect the presence of degradable substances, particularly chlorine or surfactants. Guidance for characterizing whether a toxicant(s) removed by aeration is sublutable is described, and techniques for characterizing filterable toxicity and a discussion of C_{18} solid phase extraction elutable toxicity has been added. Use of multiple manipulations is discussed and example interpretations of the results of the Phase I manipulations are provided.

Additional manuals describe the methods used to specifically identify the toxicants (*Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*) and to confirm whether or not the suspected toxicant(s) is the actual toxicant(s) (*Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*).
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TABLE OF CONTENTS

- 1 INTRODUCTION
- 2 HEALTH AND SAFETY
- 3 QUALITY ASSURANCE
 - TIE Quality Control Plans
 - Cost Considerations/Concessions
 - Variability
 - Intra-Laboratory Communication
 - Record Keeping
 - Phase I Considerations
 - Phase II Considerations
 - Phase III Considerations
- 4 FACILITIES AND EQUIPMENT
- 5 DILUTION WATER
- 6 EFFLUENT SAMPLING AND HANDLING
 - Sample Shipment and Collection in Plastic Versus Glass
- 7 TOXICITY TESTS
 - Principals
 - Test Species
 - Toxicity Test Procedures
 - Test Endpoints
 - Feeding
 - Multiple Species
- 8 PHASE I TOXICITY CHARACTERIZATION TESTS
 - Initial Effluent Toxicity Test
 - Baseline Effluent Toxicity Test
 - pH Adjustment Test
 - pH Adjustment/Filtration Test
 - pH Adjustment/Aeration Test
 - pH Adjustment/C₁₈ Solid Phase Extraction Test
 - Oxidant Reduction Test
 - EDTA Chelation Test
 - Graduated pH Test

9 TIME FRAME AND ADDITIONAL TESTS

Time Frame for Phase I Studies

When Phase I Tests Are Inadequate

Interpreting Phase I Results

Interpretation Examples

10 REFERENCES

